

Title (en)  
VARIABLE VALVE TIMING DEVICE

Title (de)  
VARIABLE VENTILSTEUERUNGSVORRICHTUNG

Title (fr)  
DISPOSITIF DE MINUTERIE DE SOUPAPE VARIABLE

Publication  
**EP 2415978 B1 20180801 (EN)**

Application  
**EP 10758520 A 20100325**

Priority  
• JP 2010055183 W 20100325  
• JP 2009091022 A 20090403

Abstract (en)  
[origin: EP2415978A1] A variable valve timing device is provided having a speed reduction mechanism that is simple in structure and which can keep the relative rotation between the camshaft and the sprocket within a predetermined angular range even if the speed reduction mechanism malfunctions. A camshaft (1) and a sprocket (2) are coaxially provided so as to be rotatable relative to each other. A speed reduction mechanism (5) is mounted in a housing (7) which is rotationally fixed to the sprocket (2). The speed reduction mechanism (5) includes an intermediate shaft (10) having a retainer portion (10b) retaining a plurality of rollers (9) disposed between the outer periphery of an eccentric shaft portion (6) of an output shaft (4) of an electric motor (3) and an internal gear (8) fixed in position in the housing (7). The intermediate shaft (10) has a stopper pin (17) provided on the intermediate shaft (10) engaged in an engaging recess (18) formed in the sprocket (2) so as to be movable within the range of the circumferential length of the recess (18). When the output shaft (4) of the electric motor (3) rotates, the rollers (9) are pressed against the teeth of the internal gear (8) by the eccentric shaft portion (6) and revolve around the output shaft (4). The revolution of the rollers (9) is transmitted to the camshaft (1) through the intermediate shaft (10), thus changing the angular position of the camshaft (1) relative to the sprocket. If the speed reduction mechanism (5) malfunctions, the stopper pin (17) engages the engaging recess (18), thus restricting the relative rotation between the intermediate shaft (10) and the stopper pin (17) within a predetermined angular range.

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Cited by  
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